U.S. Department of Energy
Office of River Protection
P.O. Box 450
Richland, Washington 99352

0058130

OCT 0 2 2002

02-EMD-173

Mr. A.W. Conklin, Head
Air Emissions and Defense
Waste Section
State of Washington
Department of Health
P.O. Box 47827
Olympia, Washington 98504

Mr. A. W. Conklin:

APPROVAL OF RADIOACTIVE AIR EMISSIONS NOTICE OF CONSTRUCTION (NOC) FOR INSTALLATION OF BREATHER FILTER ON TANK 241-C106

In accordance with Washington Administrative Code (WAC) 246-247-060, "Radioactive Air Emissions NOC Installation of Breather Filter on Tank 241-C106," is being submitted for approval.

The NOC is enclosed for review and formal approval by the State of Washington Department of Health. The NOC is being submitted in accordance with the WAC 246-247, "Radiation Protection of Air Emissions," and Title 40 Code of Federal Regulations, Part 61, "National Emission Standards for Hazardous Air Pollutants."

Tank 241-C-106 was formerly a high-heat load tank that required active ventilation to prevent the waste contained from overheating. In calendar year 2000, the majority of the waste in Tank 241-C-106 was transferred to a Double-Shell Tank. The U.S. Department of Energy, Office of River Protection has determined that there is now insufficient waste to safely operate the 296-P-16 exhauster. Without sufficient waste in the tank, operation of this exhauster may potentially cause damage to the tank liner due to induced negative pressure. In addition, it has been determined that there is also insufficient waste in the tank to cause a heat load or flammable gas hazard that would require active ventilation. Consequently, deactivation of the 296-P-16 exhauster and installation of a High Efficiency Particulate Air Filter (HEPA) a breather filter to allow passive breathing induced via atmospheric changes is planned. Active ventilation may be resumed using another exhauster when waste retrieval operations begin. This action will be addressed separately.

The 296-P-16 exhauster also ventilates Tanks C-105 and 241-C-104 through an underground cascade line. These two tanks are already equipped with HEPA breather filters so no additional action is necessary when the 296-P-16 exhauster is deactivated.

If you have any questions, please contact Dennis W. Bowser, of my staff, (509) 373-2566.

Sincerely,

James E. Rasmussen, Director
Environmental Management Division

EMD:DWB

Enclosure

cc w/encls:
B. Erlandson, BNI (w/o encls)
C. J. Kemp, CHG
L. L. Penn, CHG
J. Cox, CTUIR
J. L. Hensley, Ecology (w/o encls)
O. S. Wang, Ecology (w/o encls)
D. Bartus, EPA c/o Ecology
P. Sobotta, NPT
J. B. Hebdon, RL (w/o encls)
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J. J. Martell, WDOH Kennewick Office (4 copies)
R. Jim, YN
R. Lee, YN
Administrative Record

Enclosure
02-EMD-173

Notice of Construction for Installation of Breather Filter on Tank 241-C106

NOTIFICATION OF OFF-PERMIT CHANGE

Permit Number: 00-05-006

This notification is provided to Washington State Department of Ecology, Washington State Department of Health, and the U.S. Environmental Protection Agency as a notice of an off-permit change described as follows.

This change is allowed pursuant to WAC 173-401-724(1) as:

1. Change is not specifically addressed or prohibited by the permit terms and conditions
2. Change does not weaken the enforceability of the existing permit conditions
3. Change is not a Title I modification or a change subject to the acid rain requirements under Title IV of the FCAA
4. Change meets all applicable requirements and does not violate an existing permit term or condition
5. Change has complied with applicable preconstruction review requirements established pursuant to RCW 70.94.152.

Provide the following information pursuant to WAC-173-401-724(3):

Description of the change:

Remove the 200E P-296P016-001 stack (Emission Unit ID 234) from Table 1.1 of the Air Operating Permit which is being changed to a passive emission point by a Notice of Construction Application (DOE/RL-2002-53). The deletion of this stack requires that 241-C-106, 241-C-104, and 241-C-105 be placed into Table 2.1 of the Air Operating Permit.

The stack was primarily used for flammable gas buildup during sluicing of 241-C-106. In the last year the stack has not operated and the tank has passively "breathed" through the stack HEPA filters.

Date of Change: (To be provided in the agency approval order.)

When the Notice of Construction application is approved by the Washington State Department of Health and approved by the Washington State Department of Ecology to be placed in the Air Operating Permit.

Describe the emissions resulting from the change:

The 241-C-106, 241-C-104, and 241-C-105 stack will be changed to a passive ventilated tank. The tank has passively "breathed" in the last year through the 200E P-296P016-001 stack filters. Emissions are expected to remain the same as the current baseline.

Describe the new applicable requirements that will apply as a result of the change: (To be provided in the agency approval order.)

Annually perform periodic confirmatory measurements (PCM) by verifying the levels of smearable contamination on the inside surface of the piping downstream of the HEPA filter. The confirmation level of <10,000dpm/100cm^2 beta gamma and 200 dpm/100cm^2 shall be used to verify low emissions as defined in Table 2.1 of the Air Operating Permit.

For Hanford Use Only:

AOP Change Control Number:N/A	Date Submitted: See attached letter date

CONTENTS

FIGURES

TABLES

TERMS

ALARACT	as low as reasonably achievable control technology
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
BARCT	best available radionuclide control technology
CFR	Code of Federal Regulations
Ci	curie
HEPA	high-efficiency particulate air
MEI	maximally exposed individual
NOC	notice of construction
SEPA	*State Environmental Policy Act of 1971*
TEDE	total effective dose equivalent
WAC	*Washington Administrative Code*
WDOH	Washington State Department of Health

Table 1-1. Metric Conversion Chart.

Into metric units			Out of metric units		
If you know	Multiply by	To get	If you know	Multiply by	To get
Length			**Length**		
inches	25.40	Millimeters	millimeters	0.0393	inches
inches	2.54	Centimeters	centimeters	0.393	inches
feet	0.3048	Meters	meters	3.2808	feet
yards	0.914	Meters	meters	1.09	yards
miles	1.609	Kilometers	kilometers	0.62	miles
Area			**Area**		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.092	square meters	square meters	10.7639	square feet
square yards	0.836	square meters	square meters	1.20	square yards
square miles	2.59	square kilometers	square kilometers	0.39	square miles
acres	0.404	Hectares	hectares	2.471	acres
Mass (weight)			**Mass (weight)**		
ounces	28.35	Grams	grams	0.0352	ounces
pounds	0.453	Kilograms	kilograms	2.2046	pounds
short ton	0.907	metric ton	metric ton	1.10	short ton
Volume			**Volume**		
fluid ounces	29.57	Milliliters	milliliters	0.03	fluid ounces
quarts	0.95	Liters	liters	1.057	quarts
gallons	3.79	Liters	liters	0.26	gallons
cubic feet	0.03	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.76456	cubic meters	cubic meters	1.308	cubic yards
Temperature			**Temperature**		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit
Force			**Force**		
pounds per square inch	6.895	Kilopascals	kilopascals	1.4504×10^{-4}	pounds per square inch

Source: *Engineering Unit Conversions*, M. R. Lindeburg, PE., Second Ed., 1990, Professional Publications, Inc., Belmont, California.

1.0 INTRODUCTION

This document serves as a notice of construction (NOC), pursuant to the requirements of Washington Administrative Code (WAC) 246-247-060, and as a request for approval to construct pursuant to 40 Code of Federal Regulations (CFR) 61.07, for the installation of a breather filter on Tank 241-C-106.

Tank 241-C-106 was formerly a high-heat load tank that required active ventilation to prevent the waste contained from overheating. Subsequently, the majority of the waste in Tank 241-C-106 was transferred to a double-shell tank. CH2M HILL Hanford Group, Inc. has evaluated that there is now insufficient waste in Tank 241-C-106 to safely operate the 241-P-16 ventilation system. Without sufficient waste in the tank, operation of the ventilation system may potentially cause damage to the tank liner as a result of the induced negative pressure created. In addition, it has been determined that there is also insufficient waste in Tank 241-C-106 to cause a heat load or flammable gas hazard that would require active ventilation. Consequently, deactivation of the current ventilation is planned with installation of a breather filter to accommodate passive breathing induced via atmospheric weather changes.

The 296-P-16 exhauster also ventilates Tanks 241-C-105 and 241-C-104 through an underground cascade line. However, these tanks also do not have excessive heat generation or flammable gas and are already equipped with breather filters; so no additional installation is necessary when the exhauster is deactivated.

A very conservative estimated potential total effective dose equivalent (TEDE) to the maximally exposed individual (MEI) from this emission unit is 2.8E-02 millirem per year. The abated emissions are estimated to be 2.8E-04 millirem per year.

2.0 FACILITY NAME AND LOCATION

Regulatory Citation: "Name and address of the facility, location (latitude and longitude) if the emission unit(s)."

The 241-C Tank Farm is located:

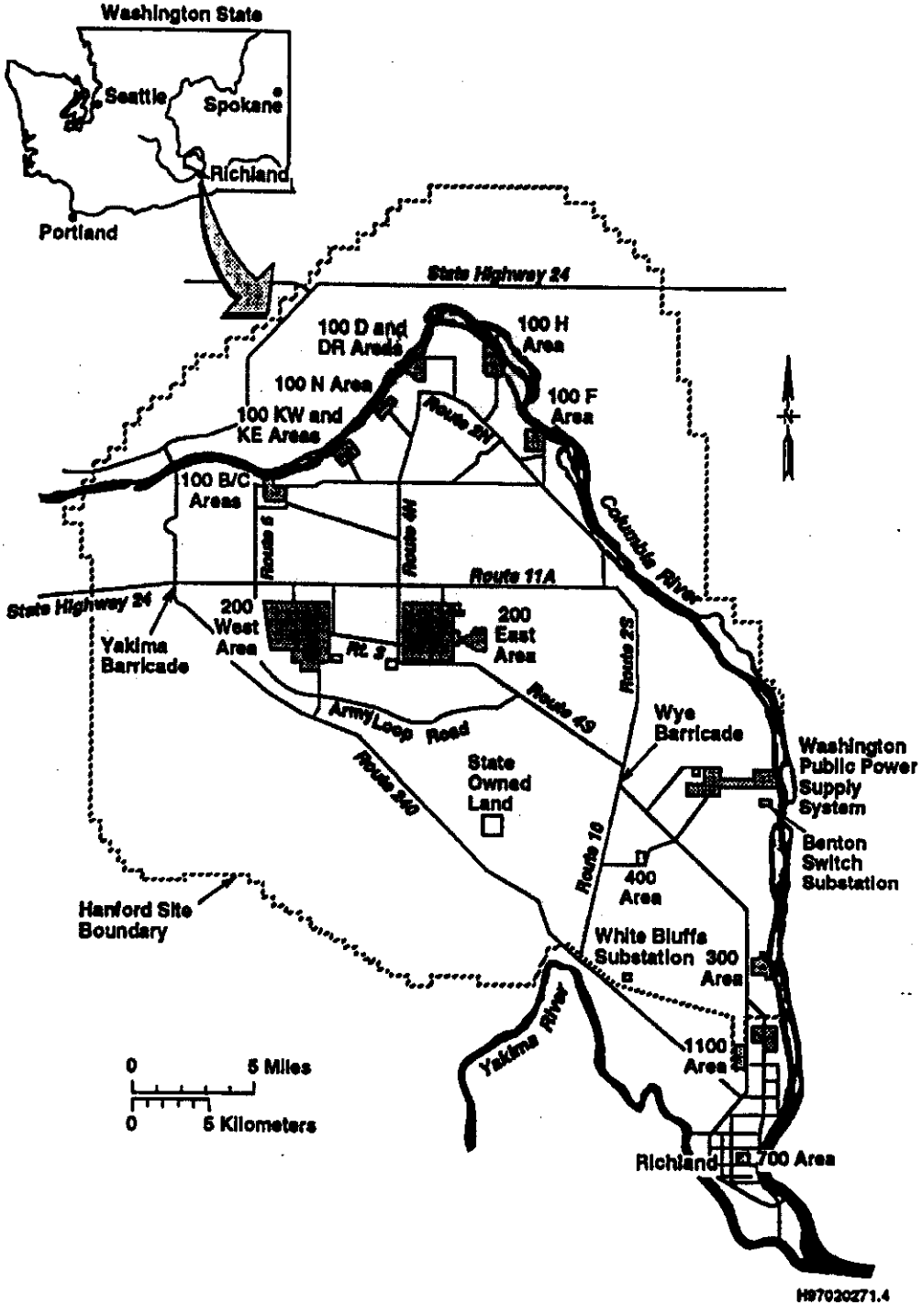
U.S. Department of Energy, Office of River Protection
Hanford Site,
200 East Area Tank Farms
Richland, Washington 99352

The C Tank Farm is due north of the PUREX Plant in the 200 East Area at the corner of Canton Avenue and Seventh Street. The currently assigned exhauster stack number is 296-P-16 and is listed in the Hanford Air Operating Permit under number 200E P-296-P-016-001. The Geodetic coordinates of 241-C-106 are:

Latitude:46* 33' 28.6"

Longitude:119* 31' 5.8".

Figure 1-1. Hanford Site.



3.0 RESPONSIBLE MANAGER

Regulatory Citation: "Name, title, address, and phone number of responsible manager."

The responsible facility manager is:

Roy J. Schepens, Manager
U.S. Department of Energy, Office of River Protection
P.O. Box 550
Richland, Washington 99352
(509) 376-6677

4.0 PROPOSED ACTION

Regulatory Citation: "Identify the type of proposed action for which this application is submitted:

a. Construction of new emission unit(s);

b. Modification of existing emission unit(s); identify whether this is a significant modification – significant means the potential-to-emit airborne radioactivity at a rate that could increase the TEDE to the MEI by at least 1.0 mrem/yr as a result of the proposed modification;

Modification of existing unit(s), unregistered."

This application is submitted in accordance with WAC 246-247-060(1)(a) for an already registered emission unit.

The proposed action will be to install a passive breather filter on Tank 241-C-106 in preparation for eventual deactivation of exhauster 296-P-16. A section of the active ventilation system ducting will be removed to disconnect Tanks 241-C-105 and 241-C-106 from the 296-P-16 Ventilation System.

The increase to the TEDE to the MEI as a result of this modification is not significant as defined by WAC 246-247-030(25).

5.0 STATE ENVIRONMENTAL POLICY ACT OF 1971

Regulatory Citation: "If the project is subject to the requirements of the State Environmental Policy Act (SEPA) contained in chapter 197-11 WAC, provide the name of the lead agency, lead agency contact person, and their phone number."

The proposed action is categorically exempt from the requirements of the State Environmental Policy Act under WAC 197-11-845.

6.0 CHEMICAL AND PHYSICAL PROCESSES

Regulatory Citation: "Describe the chemical and physical processes upstream of the emission unit(s)."

The 241-C-106 tank is a 530,000-gallon single shell tank. The tank was used to store radioactive mixed waste since 1947. A large majority of the waste was removed during the Sluicing (W-320) project. There is still approximately 48,000 gallons left in this tank. With the breather filter installed, any radioactive particulates that may be emitted as a consequence of barometric pressure changes will be minimized.

7.0 EXISTING AND PROPOSED ABATEMENT TECHNOLOGY

Regulatory Citation: "Describe the existing and proposed (as applicable) abatement technology. Describe the basis for the use of the proposed system. Include expected efficiency of each control device, and the annual average volumetric flow rate(s) in meters3/sec for the emission unit(s)."

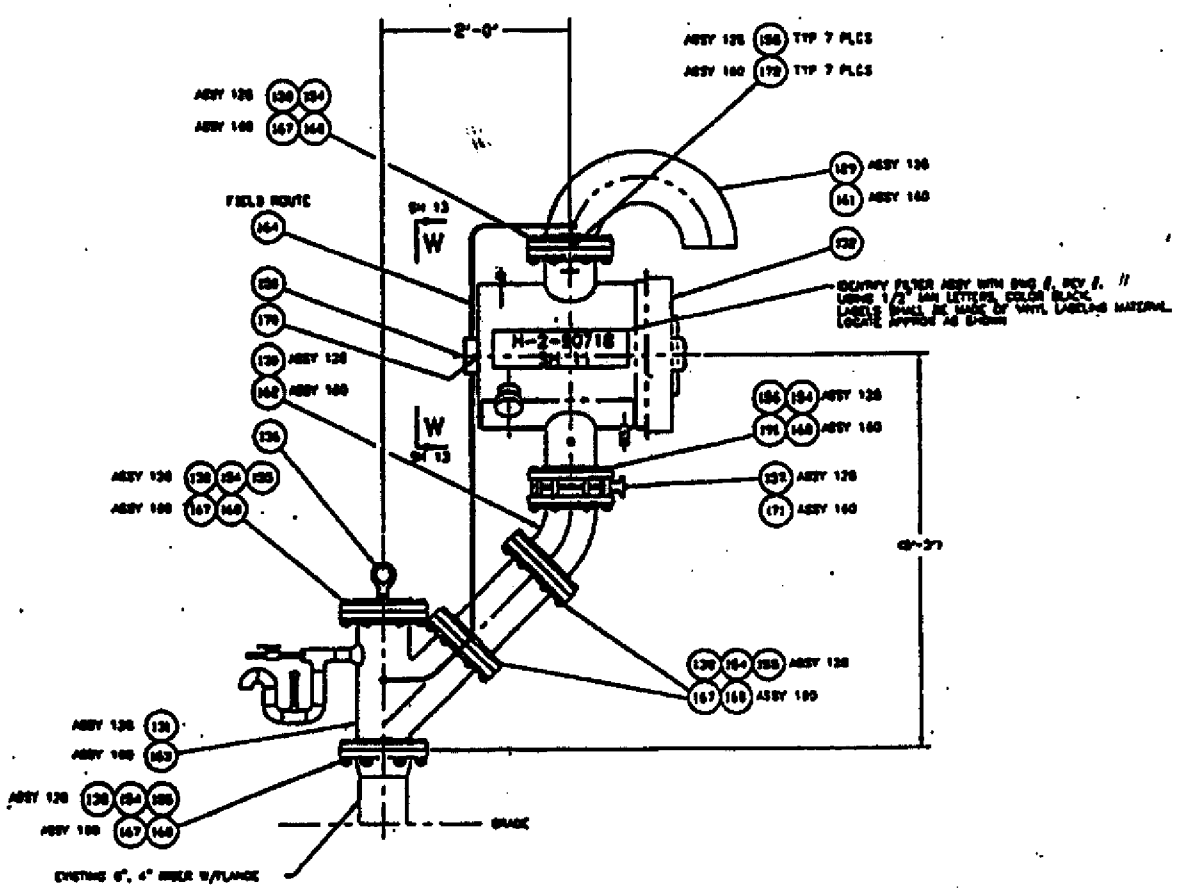
Currently Tank 241-C-106 is connected to ventilation unit 296-P-16. The unit has not operated since the summer of 2001 because of the safety concern raised due to insufficient waste remaining in the tank. The proposed abatement technology is the installation of a passive breather filter. The breather filter will be a high-efficiency particulate air (HEPA) filter with a manufacturer rated removal efficiency of 99.97%.

During installation of this breather filter, controls established in as low as reasonably achievable control technology (ALARACT) 1 "Demonstration for Riser Preparation/Opening" and ALARACT 16, "Demonstration for Work on Potentially Contamination Ventilation System Components", will be used, where applicable (HNF-4327).

8.0 APPLICABLE CONTROL TECHNOLOGY DRAWINGS

Regulatory Citation: " Provide conceptual drawings showing all applicable control technology components from the point of entry of radionuclides into the vapor space to release to the environment."

Figure 7-1. Breather Filter Assembly.



(128) BREATHER FILTER ASSY - 6" X 6" X 6"

9.0 RADIONUCLIDES OF CONCERN – POTENTIAL EMISSIONS

Regulatory Citation: "Identify each radionuclide that could contribute greater than ten percent of the potential –to-emit TEDE to the MEI."

Radionuclides estimated to contribute greater than ten percent of the potential to-emit TEDE to the MEI from operation of the breather filter at Tank C-106 are Sr-90, Cs-137, and Am-241. This is substantiated by direct application of the CAP-88 dose conversion factors, discussed in Section 14.0, to the Inventory values listed in Table 1. Multiplying the Curies of each radionuclide by the On Site MPR Cap-88 Unit Dose factors indicates that Sr-90 would contribute 23%, Cs-137 would contribute 40%, and Am-241 would contribute 28% of the dose to the MEI.

10.0 EFFLUENT MONITORING SYSTEM FOR THE PROPOSED CONTROL SYSTEM

Regulatory Citation: "Describe the effluent monitoring system for the proposed control system. Describe each piece of monitoring equipment and its monitoring capability, including detection limits, for each radionuclide that could contribute greater than ten percent of the potential-to-emit TEDE to the MEI, or greater than 0.1 mrem/yr potential-to-emit TEDE to the MEI, or greater than twenty-five percent of the TEDE to the MEI, after controls. Describe the method with detail sufficient to demonstrate compliance with the applicable requirements."

Once installed, smears will be taken in accordance with the Hanford Air Operating Permit. Monitoring during the disconnecting of the old ventilation system and the mounting of the new HEPA breather filter will be in accordance with ALARACT 1 "Demonstration for Riser Preparation/Opening" and ALARACT 16 "Tank Farm ALARACT Demonstration For Work On Potentially Contaminated Ventilation System Components."

11.0 RADIONUCLIDE ANNUAL POSSESSION QUANTITY

Regulatory Citation: "Indicate the annual possession quantity for each radionuclide."

The annual possession quantity for Tank C106 is listed in Table 10-1. The inventory data sources were as follows:

TWINS3, Best Basis/TCR, Tank Inventory taken on date 8/20/02. This data was dated within TWINS as 1/1/01.

HNF-EP-0182, Rev 157, *Waste Tank Summary Report for Month Ending April 30, 2001* indicates that 48,000 gallons of waste are left in this tank.

Table 10-1. Tank C-106 Inventory. (2 sheets)

Analyte	Inventory	
	Curies	Curies per Gallon
3H	1.55E+00	3.23E-05
14C	5.73E-02	1.19E-06
59Ni	6.53E+00	1.36E-04
60Co	1.40E+00	2.92E-05
63Ni	6.08E+02	1.27E-02
79Se	2.88E-01	6.00E-06
90Sr	2.82E+05	5.88E+00
90Y	2.82E+05	5.88E+00
93mNb	1.28E+01	2.67E-04
93Zr	1.44E+01	3.00E-04
99Tc	3.14E+00	6.54E-05
106Ru	1.69E-05	3.52E-10
113mCd	1.77E+01	3.69E-04
125Sb	2.83E+00	5.90E-05
126Sn	2.14E+00	4.46E-05
129I	1.70E-02	3.54E-07
134Cs	7.07E-02	1.47E-06
137mBa	1.66E+04	3.46E-01
137Cs	1.75E+04	3.65E-01
151Sm	1.19E+04	2.48E-01
152Eu	3.28E+00	6.83E-05
154Eu	2.67E+02	5.56E-03
155Eu	1.89E+02	3.94E-03
226Ra	4.10E-04	8.54E-09
227Ac	2.31E-03	4.81E-08
228Ra	3.15E-05	6.56E-10
229Th	2.43E-05	5.06E-10
231Pa	3.37E-03	7.02E-08
232Th	2.54E-03	5.29E-08
232U	5.30E-04	1.10E-08
233U	2.18E-03	4.54E-08
234U	4.31E-02	8.98E-07
235U	1.84E-03	3.83E-08
236U	7.66E-04	1.60E-08
237Np	2.62E-01	5.46E-06

Table 10-1. Tank C-106 Inventory. (2 sheets)

Analyte	Inventory	
	Curies	Curies per Gallon
238Pu	3.50E+00	7.29E-05
238U	4.40E-02	9.17E-07
239Pu	7.56E+01	1.58E-03
240Pu	1.54E+01	3.21E-04
241Am	2.25E+02	4.69E-03
241Pu	1.85E+02	3.85E-03
242Cm	3.56E-01	7.42E-06
242Pu	1.65E-03	3.44E-08
243Am	2.20E-03	4.58E-08
243Cm	2.81E-02	5.85E-07
244Cm	6.03E-01	1.26E-05

12.0 PHYSICAL FORM OF EACH RADIONUCLIDE IN THE INVENTORY

Regulatory Citation: "Indicate the physical form of each radionuclide in inventory: Solid, particulate solids, liquid, or gas."

Each radionuclide in the inventory listed in Table 10-1 is contained in the tank waste, which consists of sludge and liquids.

13.0 RELEASE FORM OF EACH RADIONUCLIDE IN THE INVENTORY

Regulatory Citation: "Indicate the release form of each radionuclide in inventory: Particulate solids, vapor, or gas. Give the chemical form and ICRP 30 solubility class, if known."

The radionuclides in the inventory listed in Table 10-1 are all assumed to be released as particulate except for H-3 and C-14. These are assumed to be released as a combination of particulates and gas.

14.0 RELEASE RATES

Regulatory Citation:

"a. New emission unit(s): Give predicted release rates without any emission control equipment (the potential-to-emit) and with the proposed control equipment using the efficiencies described in subsection 6 of this section.

b. Modified emission unit(s): Give predicted release rates without any emissions control equipment (the potential-to-emit) and with the existing and proposed control equipment using the efficiencies described in subsection 6 of this section. Provide the latest year's emission data or emissions estimates.

In all cases, indicate whether the emission unit is operating in a batch or continuous mode."

Release rates are shown in Table 13-1. Releases are expected to be continuous. The values were computed from vapor data cited in a Pacific NorthWest National Laboratory correspondence to Mr. Gary Wells, dated August 27, 2001. This data was generated from numerous tanks across the site. For conservatism, the maximum values seen in any of the tanks listed were used.

Table 13-1. Unabated Emissions.

						CAP-88		PTE	
						OffSite MPR	OnSite MPR	OffSite MPR	OnSite MPR
	pCi/L	Ci/m^3	Ci/ft^3	Ci/10cfm	Ci/yr	mrem/Ci	mrem/Ci	mrem/yr	mrem/yr
alpha	12	1.20E-08	3.40E-10	3.40E-09	1.79E-03	1.30E+01	1.50E+01	2.32E-02	2.68E-02
beta	7.16	7.16E-09	2.03E-10	2.03E-09	1.07E-03	1.10E-01	9.50E-03	1.17E-04	1.01E-05
Cs-137	31.8	3.18E-08	9.00E-10	9.00E-09	4.73E-03	2.40E-01	2.70E-01	1.14E-03	1.28E-03
							Sum	2.45E-02	2.81E-02

Estimated emissions were based on a passive ventilation rate of 10 cfm applied for an entire year. The 10 cfm flow rate is the estimated flow rate of a passively vented tank. This passive breathing rate is justified in HNF-SD-WM-TI-797, Rev 3, *Results of Vapor Space Monitoring of Flammable Gas Watch List Tanks.*

Abated emissions from the 296-P-16 exhauster were reported in DOE/RL-2002-20, *Radionuclide Air Emissions Report for the Hanford Site, Calendar Year 2001* as 1.6E-08 mrem. Abated emissions from the entire Hanford Site were reported as 0.49 mrem.

15.0 DISTANCES AND DIRECTION OF THE MAXIMALLY EXPOSED INDIVIDUAL

Regulatory Citation: "Identify the MEI by distances and direction from the emission unit(s). The MEI is determined by considering distance, windrose data, presence of vegetable gardens, and meat or milk producing animals at unrestricted areas surrounding the emission unit."

The MEI is determined using CAP-88 dispersion factors, which are derived for use on the Hanford Site and published in HNF-3602, Revision 1, *Calculating Potential-to-Emit Releases and Doses for FEMPs and NOCs*. Values used for the 241-C-106 tank were taken from Table 4-9, for 200 E Area with effective release height < 40 m. Unit dose factors from both the Off Site maximum public receptor (MPR) and On Site MPR were examined. The On Site MPR Unit Dose factors were used to perform the final calculations as they were determined to return the highest values. In this case, according to HNF-3602, Table 4-2, the MEI is 16,630 meters in the east southeast direction. This location is at Laser Interferometer Gravitational Wave Observatory (LIGO).

16.0 TOTAL EFFECTIVE DOSE EQUIVALENT TO THE MAXIMALLY EXPOSED INDIVIDUAL

Regulatory Citation: "Calculate the TEDE to the MEI using an approved procedure (see WAC 246-247-085). For each radionuclide identified in subsection 8 of this section, determine the TEDE to the MEI for existing and proposed emission controls, and without any emission controls (the potential-to-emit) using release rates from subsection 13 of this section. Provide all input data used in the calculations."

The unabated TEDE for the breather filter is given in Table 13-1. Abated emissions are derived by multiplying the TEDE by the filter adjustment factor of 0.01 as specified in 40 CFR 61, Appendix D as follows:

2.81E-02 mrem/yr * 0.01 = 2.81E-04 mrem/yr.

17.0 COST FACTORS

Regulatory Citation: "Provide cost factors for construction, operating, and maintenance of the proposed control technology components and system, if a BARCT or ALARACT demonstration is not submitted with the NOC."

Pursuant to WAC 246-247-110, App. A (16), cost factors for construction, operation, and maintenance of proposed technology requirements are not required, as the Washington State Department of Health (WDOH) has provided guidance that HEPA filters generally are best

available radionuclide control technology (BARCT) for particulate emissions. Because the radionuclides of concern are particulates, it is proposed that the HEPA filter controls described in Section 6.0 be accepted as BARCT. Compliance with the substantive BARCT technology standards is described in Section 18.0.

18.0 FACILITY PROCESS ESTIMATED LIFETIME

Regulatory Citation: "Provide an estimate of the lifetime for the facility process with the emission rates provided in this application."

Use of the breather filter will continue for the duration of the life of the facility. This tank may have a lifetime of approximately 10 more years.

19.0 CONTROL TECHNOLOGY STANDARDS

Regulatory Citation: "Indicate which of the following control technology standards have been considered and will be complied with in the design and operation of the emission unit(s) described in this application: . . ."

In the passive breathing mode, Tank 241-C-106 will not have the potential to emit greater than 0.1 millirem per year TEDE to the MEI. Therefore, the design of the HEPA breather filter must meet, as applicable and to the extent justified by a cost/benefit evaluation, the technology standards listed under WAC 246-247-110 (18). Table 13-1 summarizes the compliance of emissions control equipment listed with technology standards.

Table 18-1. Emissions Control Equipment Standards Compliance for Breather Filters.

Standard	Does design comply?	Notes
ASME/ANSI AG-1	Yes	Filters installed and G-1 housing design meet ASME AG-1.
ASME/ANSI N509	Yes	Filters installed and G-1 housing design meet ANSI N509.
ASME/ANSI N510	Yes	Filters are testable per ANSI N510.
ANSI/ASME NQA-1	Yes	Current version of QA program is RPP-MP-600.
ANSI N13.1	NA	Confirmatory measurements will consist of smears on the filter.
40 CFR 60, Appendix A Test Methods: 1, 1A, 2, 2A, 2C, 2D, 4	NA	ASME N510 filter testing requires airflow measurements. Other methods not required because flow rates vary based upon barometric breathing.
40 CFR 60, Appendix A Test Methods: 5, 17	NA	These methods are for sampling system designs. Periodic confirmatory measurements will be taken via smears in lieu of a sampling system.

20.0 REFERENCES

40 CFR 60, "Standards for Performance of New Stationary Sources," *Code of Federal Regulations*, as amended.

40 CFR 61, "National Emission Standards for Hazardous Air Pollutant." *Code of Federal Regulations*, as amended.

ANSI/ASME AG-1, 1997, *Code on Nuclear Air and Gas Treatment*, American Society of Mechanical Engineers, New York, New York.

ANSI/ASME NQA-1, *Quality Assurance program Requirements for Nuclear Facilities*, American Society of Mechanical Engineers, New York, New York.

ANSI/HPS N13.1, 1999, *Sampling and Monitoring Releases of Airborne Radioactive Substances from Stacks and Ducts of Nuclear Facilities*, American National Standards Institute, New York, New York.

ANSI N13.1, 1969, *Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities*, American National Standards Institute, New York, New York.

ANSI N509, *Nuclear Power Plant Air Cleaning Units and Components*, American National Standards Institute, New York, New York.

ANSI N510, *Testing of Nuclear Air Treatment Systems*, American National Standards Institute, New York, New York.

DOE/RL-2002-20, *Radionuclide Air Emissions Report for the Hanford Site, Calendar Year 2001*, U.S. Department of Energy Richland Operations Office, Richland, Washington.

HNF-EP-0182-157, *Waste Tank Summary Report for Month Ending August 31, 2001*, CH2MHILL Hanford Group, Inc., Richland, Washington.

HNF-SD-WM-TI-797, 1998, *Results of Vapor Space Monitoring of Flammable Gas Watch List Tanks*, Rev. 3, Lockheed Martin Hanford Company and DE&S Hanford, Inc., Richland, Washington.

HNF-0528, Revision 4, *National Emission Standards for Hazardous Air Pollutants (NESHAP) Quality Assurance Project Plan for Radioactive Airborne Emissions*, Fluor Hanford Group, Inc., Richland Washington

HNF-3602, Revision 1, 2002, *Calculating Potential-to-Emit Release and Dose for FEMP and NOCs*. Fluor Hanford. Group Inc., Richland, Washington.

Pacific NorthWest National Laboratory correspondence to Mr. Gary Wells, dated August 27, 2001

RPP-MP-600, 2000, *QA Program Description for the Tank Farm Contractor*, CH2M HILL Hanford Group, Inc., Richland, Washington.

HNF-4327, Revision 1A, 2002, *Control of Airborne Radioactive Emissions for Frequently Performed TWRS Work Activities (ALARACT Demonstrations)*, CH2MHILL Hanford Group, Inc., Richland, Washington.

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